Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of determining structural integrity of a bone within the spine of a patient using a neurophysiology system, the bone having a first aspect and a second aspect, said second aspect separated from said first aspect by a width and located adjacent to a spinal nerve, said method comprising:

applying an electrical stimulus to said first aspect of said bone;

electrically monitoring a plurality of leg muscle myotome locations via a plurality of electromyographic (EMG) sensor electrodes coupled to the leg muscle myotome locations, at least one of the leg muscle myotome locations being associated with said spinal nerve;

detecting ~~determining~~ an onset neuro-muscular response having an amplitude greater than a predetermined positive value in response to the application of said electrical stimulus to said first aspect of said bone by automatically increasing said electrical stimulus in constant increments until said onset neuro-muscular response is detected by one or more of the EMG sensor electrodes ~~outputting an EMG signal having an amplitude value greater that a predetermined value~~, wherein said automatic increasing is controlled by said neurophysiology system; and

displaying on an integrated display device of said neurophysiology system while ~~that is~~ viewed ~~viewable~~ by a surgeon operating on the patient's spine an onset electrical stimulus current level which causes said onset neuro-muscular response.

2. (Currently Amended) The method of claim 1, wherein the electrical stimulus is emitted from an electrode disposed on the distal end of at least one of an instrument inserted through a cannula extending toward said bone ~~a probe and surgical tool~~.

3. (Previously Presented) The method of claim 1, wherein automatically increasing said electrical stimulus in constant increments comprises applying a plurality of electrical

stimulus pulses.

4. (Previously Presented) The method of claim 3, wherein the plurality of electrical stimulus pulses comprises current pulses that automatically increase in constant increments over time until said onset neuromuscular response is determined.

5. (Previously Presented) The method of claim 1, wherein the electrical stimulus is increased by constant current increments from within the range of 0.5 to 4 milliamps.

6. (Previously Presented) The method of claim 1, wherein the electrical stimulus is increased within a current range from 0.5 to 32.0 milliamps.

7. (Canceled).

8. (Previously Presented) The method of claim 1, wherein said spinal nerve exits from successive vertebrae within the patient's spine.

9. (Original) The method of claim 1, wherein said onset neuro-muscular response is an electromyography response from a muscle coupled to said spinal nerve.

10. (Previously Presented) The method of claim 1, wherein electrically monitoring said plurality of leg muscle myotome locations is performed through the use of needle electrodes electrically coupled to leg muscle myotomes.

11. (Canceled).

12. (Canceled).

13. (Canceled).

14. (Currently Amended) ~~The method of claim 1,~~ A method of determining structural integrity of a bone within the spine of a patient using a neurophysiology system, the bone having a first aspect and a second aspect, said second aspect separated from said first aspect by a width and located

adjacent to a spinal nerve, said method comprising:

applying an electrical stimulus to said first aspect of said bone;

electrically monitoring a plurality of leg muscle myotome locations via a plurality of electromyographic (EMG) sensor electrodes coupled to the leg muscle myotome locations, at least one of the leg muscle myotome locations being associated with said spinal nerve;

determining an onset neuro-muscular response to the application of said electrical stimulus to said first aspect of said bone by automatically increasing said electrical stimulus in constant increments until said onset neuro-muscular response is detected by one or more of the EMG sensor electrodes outputting an EMG signal having an amplitude value greater than a predetermined value, wherein said automatic increasing is controlled by said neurophysiology system; and

displaying on a display device of said neurophysiology system that is viewable by a surgeon operating on the patient's spine an onset electrical stimulus current level which causes said onset neuro-muscular response, wherein displaying the onset electrical stimulus current level on the display device includes visually displaying to said surgeon an electrical current value representing said onset electrical stimulus current level causing said onset neuro-muscular response for said spinal nerve.

15. (Previously Presented) The method of claim 14, wherein visually displaying comprises illuminating lights.

16. (Currently Amended) The method of claim 14, wherein visually displaying comprises displaying ~~different~~ one of three colors on the integrated display device when the electrical current value is below a predetermined level.

17. (Previously Presented) The method of claim 16, wherein each color corresponds to a predetermined warning to the surgeon.

18. (Previously Presented) The method of claim 1 and further, comprising audibly indicating to said surgeon an intensity level representing said onset electrical stimulus current level causing said onset neuro-muscular response for said spinal nerve.

19. (Original) The method of claim 18, wherein audibly indicating comprises sounding an alarm

if said onset neuro-muscular response is detected at a predetermined intensity level.

20. (Previously Presented) The method of claim 18, further comprising varying the volume of said alarm according to variations in said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

21. (Previously Presented) The method of claim 20, wherein said volume of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said neuro-muscular response increases.

22. (Previously Presented) The method of claim 21, further comprising varying the frequency of said alarm according to said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

23. (Previously Presented) The method of claim 22, wherein said frequency of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said onset neuromuscular response increases.

24. (Original) The method of claim 1, wherein said first aspect of said bone comprises a region within a pedicle in contact with a pedicle screw.

25. (Original) The method of claim 1, wherein applying an electrical stimulus to said first aspect of said bone comprises applying said electrical stimulus to a proximal end of a bone screw inserted into said first aspect of said bone.

26. (Previously Presented) The method of claim 14, wherein visually displaying involves the use of at least one of multi-color LEDs and an integrated display.

27. (Currently Amended) ~~The method of claim 1,~~ A method of determining structural integrity of a bone within the spine of a patient using a neurophysiology system, the bone having a first aspect and a second aspect, said second aspect separated from said first aspect by a width and located adjacent to a spinal nerve, said method comprising:

applying an electrical stimulus to said first aspect of said bone;

electrically monitoring a plurality of leg muscle myotome locations via a plurality of electromyographic (EMG) sensor electrodes coupled to the leg muscle myotome locations, at least one of the leg muscle myotome locations being associated with said spinal nerve;

determining an onset neuro-muscular response to the application of said electrical stimulus to said first aspect of said bone by automatically increasing said electrical stimulus in constant increments until said onset neuro-muscular response is detected by one or more of the EMG sensor electrodes outputting an EMG signal having an amplitude value greater than a predetermined value, wherein said amplitude value greater than the predetermined value comprises a peak-to-peak amplitude value greater than ~~that~~ the predetermined value, wherein said automatic increasing is controlled by said neurophysiology system; and

displaying on a display device of said neurophysiology system that is viewable by a surgeon operating on the patient's spine an onset electrical stimulus current level which causes said onset neuro-muscular response.

28. (Currently Amended) The method of claim 1, wherein said predetermined positive value is a voltage value selected from a range of ~~about~~ 60mV to ~~about~~ 80mV.

29. (New) The method of claim 14, wherein the electrical stimulus is emitted from an electrode disposed on the distal end of at least one of an instrument inserted through a cannula extending toward said bone.

30. (New) The method of claim 14, wherein automatically increasing said electrical stimulus in constant increments comprises applying a plurality of electrical stimulus pulses, wherein the plurality of electrical stimulus pulses comprises current pulses that automatically increase in constant increments over time until said onset neuromuscular response is determined.

31. (New) The method of claim 14, wherein the electrical stimulus is increased by constant current increments from within the range of 0.5 to 4 milliamps.

32. (New) The method of claim 14, wherein the electrical stimulus is increased within a current range from 0.5 to 32.0 milliamps.

33. (New) The method of claim 14, wherein said onset neuro-muscular response is an electromyography response from a muscle coupled to said spinal nerve.

34. (New) The method of claim 14, wherein electrically monitoring said plurality of leg muscle myotome locations is performed through the use of needle electrodes electrically coupled to leg muscle myotomes.

35. (New) The method of claim 14, and further comprising audibly indicating to said surgeon an intensity level representing said onset electrical stimulus current level causing said onset neuro-muscular response for said spinal nerve.

36. (New) The method of claim 35, wherein audibly indicating comprises sounding an alarm if said onset neuro-muscular response is detected at a predetermined intensity level.

37. (New) The method of claim 35, further comprising varying the volume of said alarm according to variations in said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

38. (New) The method of claim 37, wherein said volume of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said neuro-muscular response increases.

39. (New) The method of claim 38, further comprising varying the frequency of said alarm according to said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

40. (New) The method of claim 39, wherein said frequency of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response increases.

41. (New) The method of claim 14, wherein said first aspect of said bone comprises a region within a pedicle in contact with a pedicle screw.

42. (New) The method of claim 14, wherein applying an electrical stimulus to said first aspect of said bone comprises applying said electrical stimulus to a proximal end of a bone screw inserted into said first aspect of said bone.

43. (New) The method of claim 14, wherein said amplitude value greater than the predetermined value comprises a peak-to-peak amplitude value greater than the predetermined value.

44. (New) The method of claim 43, wherein said predetermined value is a voltage value selected from a range of 60mV to 80mV.

45. (New) The method of claim 27, wherein displaying the onset electrical stimulus current level on the display device includes visually displaying to said surgeon an electrical current value representing said onset electrical stimulus current level causing said onset neuro-muscular response for said spinal nerve.

46. (New) The method of claim 27, wherein the electrical stimulus is emitted from an electrode disposed on the distal end of at least one of an instrument inserted through a cannula extending toward said bone.

47. (New) The method of claim 27, wherein automatically increasing said electrical stimulus in constant increments comprises applying a plurality of electrical stimulus pulses, wherein the plurality of electrical stimulus pulses comprises current pulses that automatically increase in constant increments over time until said onset neuromuscular response is determined.

48. (New) The method of claim 27, wherein the electrical stimulus is increased by constant current increments from within the range of 0.5 to 4 milliamps.

49. (New) The method of claim 27, wherein the electrical stimulus is increased within a current range from 0.5 to 32.0 milliamps.

50. (New) The method of claim 27, wherein said onset neuro-muscular response is an electromyography response from a muscle coupled to said spinal nerve.

51. (New) The method of claim 27, wherein electrically monitoring said plurality of leg muscle myotome locations is performed through the use of needle electrodes electrically coupled to leg muscle myotomes.

52. (New) The method of claim 27, and further comprising audibly indicating to said surgeon an intensity level representing said onset electrical stimulus current level causing said onset neuro-muscular response for said spinal nerve.

53. (New) The method of claim 52, wherein audibly indicating comprises sounding an alarm if said onset neuro-muscular response is detected at a predetermined intensity level.

54. (New) The method of claim 52, further comprising varying the volume of said alarm according to variations in said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

55. (New) The method of claim 54, wherein said volume of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said neuro-muscular response increases.

56. (New) The method of claim 55, further comprising varying the frequency of said alarm according to said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response.

57. (New) The method of claim 56, wherein said frequency of said alarm decreases as said intensity level of said onset electrical stimulus current level causing said onset neuro-muscular response increases.

58. (New) The method of claim 27, wherein said first aspect of said bone comprises a region within a pedicle in contact with a pedicle screw.

59. (New) The method of claim 27, wherein applying an electrical stimulus to said first aspect of said bone comprises applying said electrical stimulus to a proximal end of a bone screw inserted into said first aspect of said bone.

60. (New) The method of claim 27, wherein said predetermined value is a voltage value selected from a range of 60mV to 80mV.